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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,452	01/16/2004	Takuya Tsukagoshi	890050.456	7727

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EXAMINER	
NGUYEN, LINH THI	
ART UNIT	**PAPER NUMBER**
2627	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,452	TSUKAGOSHI, TAKUYA	
	Examiner	Art Unit	
	Linh T. Nguyen	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-8,10-12,14-16 and 18-22* is/are rejected.

7)☒ Claim(s) *2,4,9,13 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5-8, 10-12, 14-16, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Psaltis et al (US Patent Number 5949558) in view of Trisnadi (US Patent number 5627664).

In regards to claims 1 and 5, Psaltis et al discloses a holographic recording method for recording information as phase information of light by projecting a signal beam and a reference beam onto a recording medium (column 4, lines 8-14), wherein an X direction is defined as the direction of a line of intersection between a plane including the optical axes of the signal beam (Fig. 3) and reference beam (incidence plane) and the recording plane of the recording medium, and the Y direction is defined as the direction of a line lying normal to the incidence plane and intersecting said line of intersection (Fig. 3), comprising steps of; recording at a position shifted in the Y direction a second hologram that partially overlaps the first hologram (Fig. 4). However, Psaltis et al does not disclose a holographic recording method comprising steps of: using the reference beam modulated with a first phase code to record a first hologram at a predetermined position; and using the reference beam modulated with a second phase code whose pattern is different from that of the first phase code.

In the same field of endeavor, Trisnadi discloses a holographic recording method comprising steps of: using the reference beam modulated with a first phase code to record a first hologram at a predetermined position (Fig. 2A); and using the reference beam modulated with a second phase code whose pattern is different from that of the first phase code (Fig. 2B). At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Psaltis et al holographic recording method to record a hologram shifted in the y-direction with corresponds phase code as Trisnadi suggested. The motivation for doing so would have been to increase storage capacity.

In regards to claim 6, Psaltis et al discloses a holographic recording method with increasing overlap of holograms recorded by shift multiplexing the Y direction (Fig. 4). Psaltis et al does not but Trisnadi discloses a holographic recording method wherein phase codes used in the phase code multiplexing have lower correlation with increase of pages stored in a stack site (Column 5, lines 45-49). The motivation for doing so would have been to increase the overlapping of holograms, therefore, increase the capacity of the disk.

In regards to claims 7 and 8, Psaltis et al discloses a holographic recording method to record holograms in the Y direction (Fig. 4). Psaltis does not but Trisnadi discloses a holographic recording method, wherein orthogonal phase codes are used for holograms (Column 5, lines 15-18). The motivation is the same as claim 6 above.

In regards to claims 10, 11 and 12, Psaltis et al does not but Trisnadi discloses a holographic recording method, wherein the holograms are recorded along both the X direction and Y direction by shift multiplexing (Column 3, lines 46-49 and lines 65-67). The motivation is the same as claim 6 above.

In regards to claims 14, 15, 16, 18, 19 and 20, Psaltis et al does not but Trisnadi discloses a holographic recording method in accordance with claim 10, wherein the same phase code is used for holograms recorded along the X direction (Fig. 2A-B phase codes are used for both X-Y direction). The motivation is the same as claim 6 above.

In regards to claim 21, Psaltis et al discloses a holographic recording method in accordance with claim 5, wherein the recording medium is a disk, and the X direction and Y direction are the tracking direction and the radial direction of the disk, respectively (Fig. 3 and 4).

In regards to claim 22, Psaltis et al discloses a holographic recording device for recording information as phase information of light by projecting a signal beam and a reference beam onto a recording medium (Fig. 2) comprising: a laser beam source (Fig. 2, element 10); a beam splitter (Fig. 2, element 24) for dividing the beam from the laser beam source (Fig.2); a spatial light modulator for generating a signal beam containing information by modulating the intensity of one divided beam (Fig. 2, element 28); a

controller for controlling the incidence position of the signal beam and reference beam on the recording medium (Fig. 6, element 27); wherein, an X direction is defined as the direction of a line of intersection between an incidence plane including the optical axes of the signal beam and reference beam and the recording plane of the recording medium (Fig. 3), a Y direction is defined as the direction of a line perpendicular to the incidence plane (Fig. 3 and 4), and the controller records holograms by shift multiplexing at least in the Y direction (Fig. 4). However, Psaltis et al does not disclose a phase spatial light modulator for generating a reference beam by modulating the phase of the other divided beam with a predetermined phase code and phase code multiplexing.

In the same field of endeavor, Trisnadi discloses a holographic recording device, comprising: a phase spatial light modulator (Fig. 1A, element 28) for generating a reference beam (Fig. 1A, element 18) by modulating the phase of the other divided beam with a predetermined phase code (Fig. 2A-C); and phase code multiplexing in the X-Y direction (Column 3, lines 46-49 and lines 65-67). The motivation is the same as claim 1 above.

Claims 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Psaltis et al in view of Trisnadi as applied to claim 1 above, and further in view of Wilson et al (US Patent Number 6697180).

In regards to claim 3, Psaltis does not but Trisnadi discloses a holographic recording method including a step of using the reference beam modulated with the first phase code (Fig. 2A). However, Psaltis et al and Trisnadi do not disclose a holographic recording method of recording position shifted to the X direction a fourth hologram that partially overlaps the first hologram.

In the same field of endeavor, Wilson et al discloses a holographic recording method of recording position shifted to the X direction a fourth hologram that partially overlaps the first hologram (Fig. 3A). At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the holographic recording method of Psaltis et al and Trisnadi to also shift the fourth holograms in the X direction. The motivation for doing so would have been to increase the storage capacity.

Allowable Subject Matter

Claims 2, 4, 9, 13 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 2:

Psaltis et al, Trisnadi and Wilson et al disclose a holographic recording method further comprising a step of using the reference beam modulated with a third phase code whose pattern is different from that of the first and second phase codes to record at a position shifted in the Y direction a third hologram that partially overlaps the first and second holograms. **The prior art made of record neither discloses nor**

suggests the combination of limitations wherein a correlation between the third phase code and the second phase code being set lower than a correlation between the third phase code and the first phase code. Claims 4, 9, 13, and 17 depends on claim 2, therefore, are allowable if claim 2 is rewritten in independent form.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linh T. Nguyen whose telephone number is 571-272-5513. The examiner can normally be reached on 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LN
01/03/07

THANG V. TRAN
PRIMARY EXAMINER